

WHAT IS CLAIMED IS:

1 1. An isolated nucleic acid encoding a G-protein coupled receptor
2 polypeptide, the polypeptide encoded by the nucleic acid comprising greater than 70%
3 amino acid identity to an amino acid sequence of SEQ ID NO:2, SEQ ID NO:4, SEQ ID
4 NO:6, or SEQ ID NO:8.

1 2. The isolated nucleic acid of claim 1, wherein the nucleic acid
2 encodes a polypeptide that specifically binds to polyclonal antibodies generated against
3 an amino acid sequence of SEQ ID NO:2, SEQ ID NO:4, SEQ ID NO:6, or SEQ ID
4 NO:8.

1 3. The isolated nucleic acid of claim 1, wherein the nucleic acid
2 encodes a polypeptide that has G-protein coupled receptor activity.

1 4. The isolated nucleic acid of claim 1, wherein the nucleic acid
2 encodes a polypeptide comprising an amino acid sequence of SEQ ID NO:2, SEQ ID
3 NO:4, SEQ ID NO:6, or SEQ ID NO:8.

1 5. The isolated nucleic acid of claim 1, wherein the nucleic acid
2 comprises a nucleotide sequence of SEQ ID NO:1, SEQ ID NO:3, SEQ ID NO:5, or SEQ
3 ID NO:7.

1 6. The isolated nucleic acid of claim 1, wherein the nucleic acid is
2 from a human, a mouse, or a rat.

1 7. The isolated nucleic acid of claim 1, wherein the nucleic acid is
2 amplified by primers that specifically hybridize under stringent hybridization conditions
3 to the same sequence as primer sets selected from the group consisting of:

4
5 ATGTTGGGGAACGTCGCCATC (SEQ ID NO:9) and
6 TCATCCACAGAGCCTCCAGAT (SEQ ID NO:10);

7
8 ATGGGAAAGGACAATCCAGTT (SEQ ID NO:11) and
9 CTAAGAGAGTAACTCCAGCAA (SEQ ID NO:12);

10

11 ATGGAAATAGCCAATGTGAGTTC (SEQ ID NO:13) and
12 TAAATTTGCGCCAGCTTGCCTG (SEQ ID NO:14);
13 and
14 ATGGTGAGACATACCAATGAGAG (SEQ ID NO:15) and
15 CATAAAATATTTACTCCCAGAGCC (SEQ ID NO:16).

1 8. The isolated nucleic acid of claim 1, wherein the nucleic acid
2 encodes a polypeptide having a molecular weight of about between 25 to 35 kDa or about
3 between 32 to 42 kDa.

1 9. An isolated nucleic acid encoding a G-protein coupled receptor
2 polypeptide, wherein the nucleic acid specifically hybridizes under stringent hybridization
3 conditions to a nucleic acid having a nucleotide sequence of SEQ ID NO:1, SEQ ID
4 NO:3, SEQ ID NO:5, or SEQ ID NO:7.

1 10. An isolated nucleic acid encoding a G-protein coupled receptor
2 polypeptide, the polypeptide encoded by the nucleic acid comprising greater than about
3 70% amino acid identity to a polypeptide having an amino acid sequence of SEQ ID
4 NO:2, SEQ ID NO:4, SEQ ID NO:6 or SEQ ID NO:8, wherein the nucleic acid
5 selectively hybridizes under moderately stringent hybridization conditions to a nucleotide
6 sequence of SEQ ID NO:1, SEQ ID NO:3, SEQ ID NO:5, or SEQ ID NO:7.

1 11. An isolated G-protein coupled receptor polypeptide, the
2 polypeptide comprising greater than about 70% amino acid sequence identity to an amino
3 acid sequence of SEQ ID NO:2, SEQ ID NO:4, SEQ ID NO:6, or SEQ ID NO:8.

1 12. The isolated polypeptide of claim 11, wherein the polypeptide
2 specifically binds to polyclonal antibodies generated against SEQ ID NO:2, SEQ ID
3 NO:4, SEQ ID NO:6 or SEQ ID NO:8.

1 13. The isolated polypeptide of claim 11, wherein the polypeptide has
2 G-protein coupled receptor activity.

1 14. The isolated polypeptide of claim 11, wherein the polypeptide has
2 an amino acid sequence of SEQ ID NO:2, SEQ ID NO:4, SEQ ID NO:6 or SEQ ID NO:8.

- 1 15. The isolated polypeptide of claim 11, wherein the polypeptide is
2 from a human, a rat, or a mouse.
- 1 16. An antibody that selectively binds to the polypeptide of claim 11.
- 1 17. An expression vector comprising the nucleic acid of claim 1.
- 1 18. A host cell transfected with the vector of claim 17.
- 1 19. A method for identifying a compound that modulates signal
2 transduction, the method comprising the steps of:
3 (i) contacting the compound with a polypeptide comprising greater than
4 70% amino acid sequence identity to the amino acid sequence of SEQ ID NO:2, SEQ ID
5 NO:4, SEQ ID NO:6, or SEQ ID NO:8; and
6 (ii) determining the functional effect of the compound upon the
7 polypeptide.
- 1 20. The method of claim 19, wherein the polypeptide has G-protein
2 coupled receptor activity.
- 1 21. The method of claim 19, wherein the polypeptide is linked to a
2 solid phase.
- 1 22. The method of claim 21, wherein the polypeptide is covalently
2 linked to a solid phase.
- 1 23. The method of claim 19, wherein the functional effect is
2 determined by measuring changes in intracellular cAMP, IP3, or Ca²⁺.
- 1 24. The method of claim 19, wherein the functional effect is a chemical
2 effect.
- 1 25. The method of claim 19, wherein the functional effect is a physical
2 effect.
- 1 26. The method of claim 19, wherein the functional effect is
2 determined by measuring binding of the compound to the polypeptide.

- 1 27. The method of claim 19, wherein the polypeptide is recombinant.
- 1 28. The method of claim 19, wherein the polypeptide is from a rat, a
2 mouse, or a human.
- 1 29. The method of claim 19, wherein the polypeptide comprises an
2 amino acid sequence of SEQ ID NO:2, SEQ ID NO:4, SEQ ID NO:6 or SEQ ID NO:8.
- 1 30. The method of claim 19, wherein the polypeptide is expressed in a
2 cell or cell membrane.
- 1 31. The method of claim 30, wherein the cell is a eukaryotic cell.
- 1 32. A method of treating cancer, the method comprising the step of
2 contacting a cancer cell with a therapeutically effective amount of an antibody, the
3 antibody specifically binding to a polypeptide comprising greater than 70% amino acid
4 identity to the amino acid sequence of SEQ ID NO:2, SEQ ID NO:4, SEQ ID NO:6, or
5 SEQ ID NO:8.
- 1 33. The method of claim 34, wherein the antibody specifically binds to
2 a polypeptide comprising greater than 70% amino acid identity to the amino acid
3 sequence of SEQ ID NO:6.
- 1 34. A method of treating cancer, the method comprising the step of
2 contacting a cancer cell comprising a G-protein coupled receptor with a therapeutically
3 effective amount of a compound identified using the method of claim 19.
- 1 35. The method of claim 34, wherein the cancer is breast cancer.
- 1 36. The method of claim 34, wherein the compound is an antagonist of
2 a polypeptide comprising greater than 70% amino acid identity to the amino acid
3 sequence of SEQ ID NO:6.
- 1 37. A method of detecting the presence of an BCA-GPCR nucleic acid
2 or polypeptide in human tissue, the method comprising the steps of:
3 (i) isolating a biological sample;

4 (ii) contacting the biological sample with a BCA-GPCR-specific
5 reagent that selectively associates with an BCA-GPCR nucleic acid or polypeptide; and,
6 (iii) detecting the level of BCA-GPCR-specific reagent that
7 selectively associates with the sample.

1 38. The method of claim 37, wherein the BCA-GPCR-specific reagent
2 is selected from the group consisting of: BCA-GPCR-specific antibodies, BCA-GPCR-
3 specific oligonucleotide primers, and BCA-GPCR-specific nucleic acid probes.

1 39. The method of claim 37, wherein the tissue is breast cancer tissue.

1 40. A method of making a G-protein coupled receptor polypeptide, the
2 method comprising the step of expressing the polypeptide from a recombinant expression
3 vector comprising a nucleic acid encoding the polypeptide, wherein the amino acid
4 sequence of the polypeptide comprises greater than about 70% amino acid identity to a
5 polypeptide having an amino acid sequence of SEQ ID NO:2, SEQ ID NO:4, SEQ ID
6 NO:6 or SEQ ID NO:8.

1 41. A method of making a recombinant cell comprising a G-protein
2 coupled receptor polypeptide, the method comprising the step of transducing the cell with
3 an expression vector comprising a nucleic acid encoding the polypeptide, wherein the
4 amino acid sequence of the polypeptide comprises greater than about 70% amino acid
5 identity to a polypeptide having an amino acid sequence of SEQ ID NO:2, SEQ ID NO:4,
6 SEQ ID NO:6, or SEQ ID NO:8.